DOCUMENT RESUME

ED 184 453 HE 012 479

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TITLE When Does an Increase in the Cost of Education Lead to an Increase in a BEOG? A Note.
SPONS AGENCY Sloan Commission on Government and Higher Education, Cambridge, Mass.
PUB DATE 10 Jul 79
NOTE 15p.; For related Sloan Commission documents see HE 012 421-427, HE 012 429-432, HE 012 434-439, HE 012 442-445, HE 012 448-449, HE 012 465-474, HE 012 476-480, HE 482-490. This draft corrects and supercedes the preliminary draft of April 16, 1979

EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS *Computation; Economic Change; Educational Economics; *Federal Aid; Government School Relationship; Higher Education; *Inflation (Economics); Mathematical Formulas; Parent Financial Contribution; *Student Costs; *Student Financial Aid; Tuition
IDENTIFIERS *Basic Educational Opportunity Grants; *Sloan Commission Studies

ABSTRACT

With the aid of a diagram, an analysis is presented of the circumstances under which a Basic Educational Opportunity Grant (BEOG) award can increase when the recipient's college raises its charges. The starting point for the analysis is a specification of how to compute BEOG awards as a function of the cost of education (COE) and the expected family contribution (EFC). Examples are cited which demonstrate that under some circumstances an institution can have a windfall at the expense of the federal government by raising its charges. However, an unsophisticated attempt to capture that windfall could backfire. (SW)

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ED184453

Senior Member :

Bilog Computer in the Evaluation
And Higher Education

Draft

This draft corrects and supersedes
the preliminary draft of
16 April 1978

10 July 1978

The content of this work
is the responsibility of
the author alone.

Large-scale federal spending on financial aid now exists side by side with substantial pressure to contain state and local budgets. This situation raises questions about the impact of an increase in institutions' prices. The central issue is whether, by raising prices, the institution can pass along costs to the federal government. An important aspect of this issue turns out, with the aid of a diagram, to be relatively straightforward to analyze.

The diagram can help answer this question: under what circumstances does a BEOG award increase when the recipient's college raises its charges?

The starting point for the analysis is to specify how to compute BEOG awards as a function of the cost of education (COE) and the expected family contribution (EFC). At full-funding, the unabbreviated procedure is the following: for each combination of COE and EFC, compute

1. $1800 minus EFC,
2. One-half of COE,
3. COE minus EFC.

The size of the award equals the smallest of these three quantities unless that smallest value is below $200 in which case no award is made.[1,2]

A brief comment about each of these four conditions -- those numbered 1, 2, 3 plus the minimum award constraint of $200 -- is in order. The first is the basis for the frequently accepted notion that $1800 of support for college has been established as a floor for all full-time undergraduates. If the other constraints were not part of the law and if families always contributed as much as the system expects, that notion would be accurate. In fact, however -- as what follows should make quite clear -- $1800 is definitely available only to some students; others could end up with much less. Although there are a few special cases in which the minimum is even

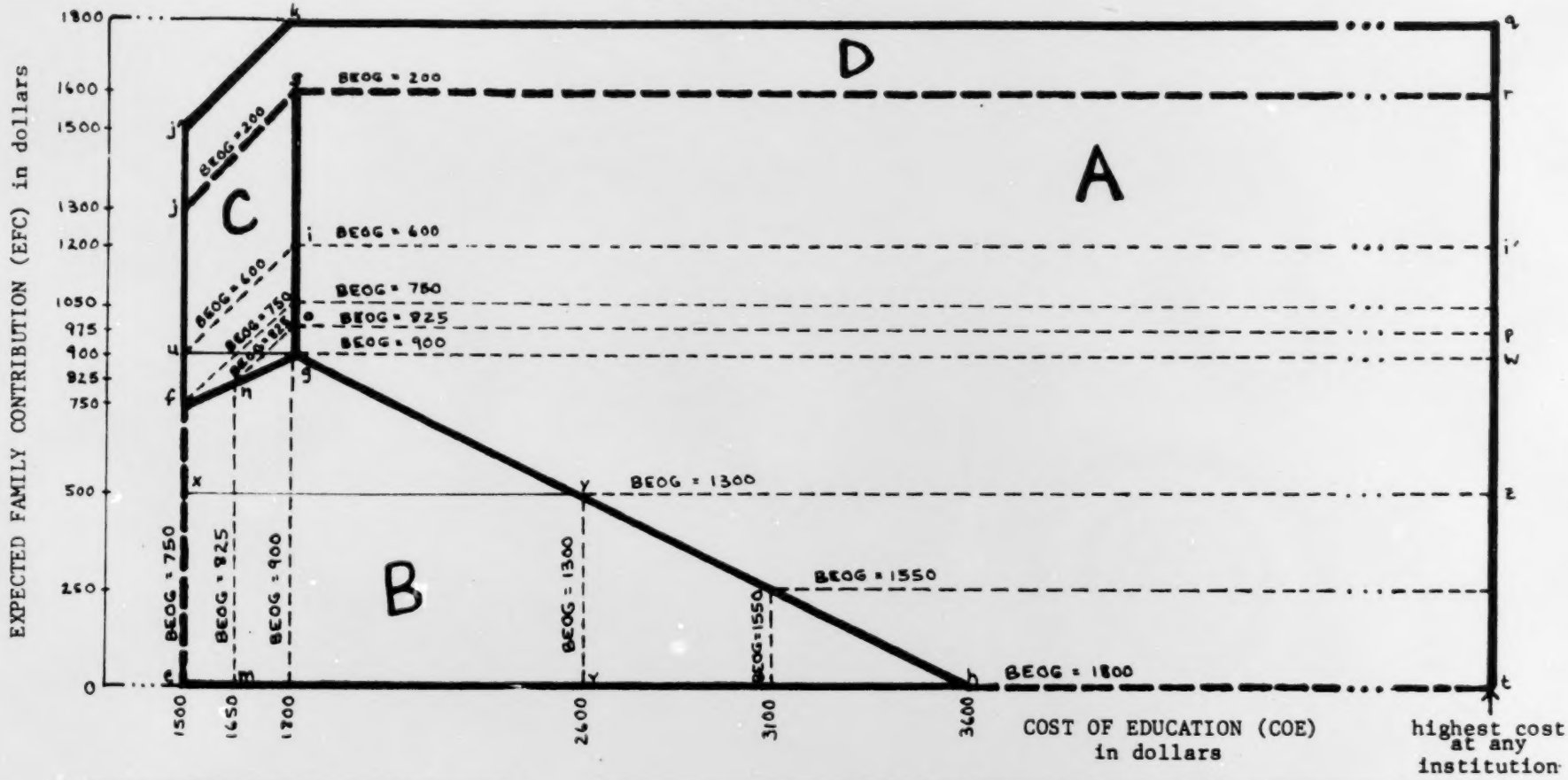
lower, for practical purposes the floor in the sense of being the amount available to the poorest students in the least expensive colleges is $750. The second condition states what is commonly known as the half-cost limitation, the legislation's restriction that a BEOG award shall in no case exceed 50 percent of the COE. The third condition expresses the legislation's requirement that the award shall not exceed the amount needed in this sense: when the award is added to the EFC, the resulting sum may not exceed the COE. Finally, the minimum award constraint has the effect of denying a BEOG to any student whose EFC exceeds $1600 and, in some circumstances, even to students with EFCs which are lower.

There are a few exceptions, but for most practical purposes $1500 is the lower limit of COE and is so regarded in the main text of this note. For the interested reader the appendix shows the impact of allowing COE to assume values below $1500.

These comments provide an introduction to Figure 1 which depicts the level of BEOG awards as a function of the COE and the EFC. Here is how to interpret the diagram. Define an iso-BEOG as the locus of points for which the BEOG award is a constant. It turns out that there are four types of iso-BEOGs, and Table 1 summarizes the major characteristics of each type. The dashed (----) lines in Figure 1 are examples of iso-BEOGs, and each is labelled with the level of award to which it corresponds. For example, mnop is the iso-BEOG composed of all combinations of cost and expected family contribution which result in an award of $825; it happens to be an iso-BEOG of Type II. Other iso-BEOGs in Figure 1 should be similarly interpreted.

The regions labelled A, B, C, and D have special significance. Throughout each region a specific one of the four award rules governs the actual size of the award. In particular, in A awards are governed by $1800 minus

Figure 1: ISO-BEOGs AND THE FOUR REGIONS CORRESPONDING TO THE FOUR AWARD RULES
(BEOGs in dollars)



DEFINITION OF REGIONS		
Region	Location of Corners	Governing Award Rule
A	g,s,r,t,h	$1800-EFC
B	e,f,g,h	½COE
C	f,j,s,g	COE-EFC
D	k,q,r,s,j,j'	minimum award=$200

BOUNDARY AND ISO-BEOG CODE	
Boundaries of Regions	Iso-BEOGs or Portions of an Iso-BEOG not Coinciding with Boundary
——— in general	Type I, Type II, Type III ----- Type IV = none (The only Type IV iso-BEOG is ht which forms a portion of the boundary of region A.)
– – – where boundary and an iso-BEOG or a segment of an iso-BEOG coincide	

TABLE 1

Characteristics of the Four Major Types of Iso-BEOGs

Type	General Shape	Range of Awards for Iso-BEOGs of each type* ($)	An Example of an Iso-BEOG of each type
I	Piecewise linear in 2 pieces with 1 segment having a slope of 1 and 1 segment parallel to the COE axis	$200 \leq BEOG < 750$	uii′
II	Piecewise linear in 3 pieces with 1 segment parallel to each axis and the segment between these 2 segments having a slope of 1	$750 \leq BEOG < 900$	mnop
III	Piecewise linear in 2 pieces with 1 segment parallel to the EFC axis and 1 segment parallel to the COE axis	$900 \leq BEOG < 1800$	vyz
IV	Linear, coincides with COE axis for $COE \geq 3600$	BEOG = 1800 (Note that there is only one iso-BEOG of Type IV.)	ht

*The definition of $750 as the non-included upper limit on awards for Type I iso-BEOGs and as the included lower limit on awards for Type II iso-BEOGs assumes that $1500 is the minimum value for the COE. For minimum COE exceeding $400, the more general statements for the range of awards would be,

for Type I iso-BEOGs, $200 \leq BEOG < \frac{\text{minimum COE}}{2}$

and

for Type II iso-BEOGs, $\frac{\text{minimum COE}}{2} \leq BEOG < 900.$

The appendix illustrates the point. As Appendix Figure 1 makes clear, when COE's minimum is exactly $400, then there are no Type I iso-BEOGs.

EFC; in B, by ½ COE; in C, by COE minus EFC; and in D, by the condition that $200 is the smallest award permissible.[3] Table 2 illustrates the computation of one award within each region.[4]

Figure 1 makes it easy to determine when an increase in the cost of education does, and when it does not, lead to an increase in a BEOG award. Consider first, an increase in the cost of education for a student with an expected family contribution of $500. Let $1500 be the initial COE. As cost increases, the path describing the student's changing situation is the one moving to the right along xyz. Between x and y the governing rule is the one of region B, half-cost, and the move involves crossing iso-BEOGs representing ever higher awards. At x the COE is $1500 and the BEOG is $750 whereas at y the COE is $2600 and the BEOG is $1300. Thus while the COE has increased by $1100, the BEOG has increased by $550. To state the general result, while the half-cost constraint governs, the BEOG award increases by one-half dollar for every dollar increase in cost. By contrast, the move from y towards z is within region A, and it is along a single iso-BEOG representing an unchanging award of $1300.

Consider another example, an increase in the cost of education starting from $1500 for a student with an EFC of $900. In this case, the path describing the student's changing situation is the one moving to the right along ugw. Between u and g, the governing constraint is the one of region C pertaining to need, and the move once again involves crossing iso-BEOGs representing ever higher awards. At u the COE is $1500 and the BEOG is $600 whereas at g both are greater by $300. Thus while the need constraint governs, the BEOG award increases dollar-for-dollar with every increase in cost. As the move continues beyond g towards w, it is, again, within region A and along a single iso-BEOG representing, in this case, a constant award of $900.

TABLE 2

An Example of the Computation of One Award in Each Region

			Computation of the Three Quantities			The Award Equals		
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Region	COE ($)	EFC ($)	1800-EFC ($)	½COE ($)	COE-EFC ($)	Smallest of entries in cols. (4), (5), and (6) if that value is greater than or equal to $200. ($)	OR 0 if smallest of entries in cols. (4), (5), and (6) is less than $200.	Binding Constraint ($)
A	2100	1150	650	1150	950	650	---	(1800-EFC)
B	1600	500	1300	800	1100	800	---	½COE
C	1500	1200	600	750	300	300	---	COE-EFC
D	3600	1601	199	1800	1999	---	0	minimum award=200

A similar illustration could be provided for any other initial cost, initial expected family contribution, and specified increase in cost.

The central result is the following: when the institution raises its charges, the BEOG award increases for those students whose awards are constrained by the half-cost limitation and, even faster, for those whose awards are constrained by the need criterion. However, as soon as sgh has been crossed so that region A has been entered, neither half-cost nor need is the binding constraint, and a further increase in the cost of education no longer increases the BEOG award at all. The specific results relating increases in COE to increases in BEOG awards are summarized in Table 3.

TABLE 3

Summary Relating Increases in COE to Increases in BEOG Awards

Question: What proportion of an increase in COE will be met by an increase in the BEOG award?

Answer: In Region	Proportion
A	none
B	half
C	all
D	none

The foregoing demonstration makes it clear that, under some circumstances, an institution can have a windfall at the expense of the federal government by raising its charges. However, it must quickly be added that an unsophisticated attempt to capture that windfall could backfire. To be

sure, in region C all, and in region B half, of an increase in COE will automatically be covered by an increase in BEOG awards. But the important corollary is that as long as some students are not governed by the rule of region C, some portion of an increase in the COE will not be covered by an increase in BEOG awards. Any part of such a residual not covered by other forms of financial aid would remain for the student to pay. If the prospect of having to pay this remaining portion caused some students either to withdraw or to fail to enroll, the institution would lose some fraction of the revenue it would otherwise have received.

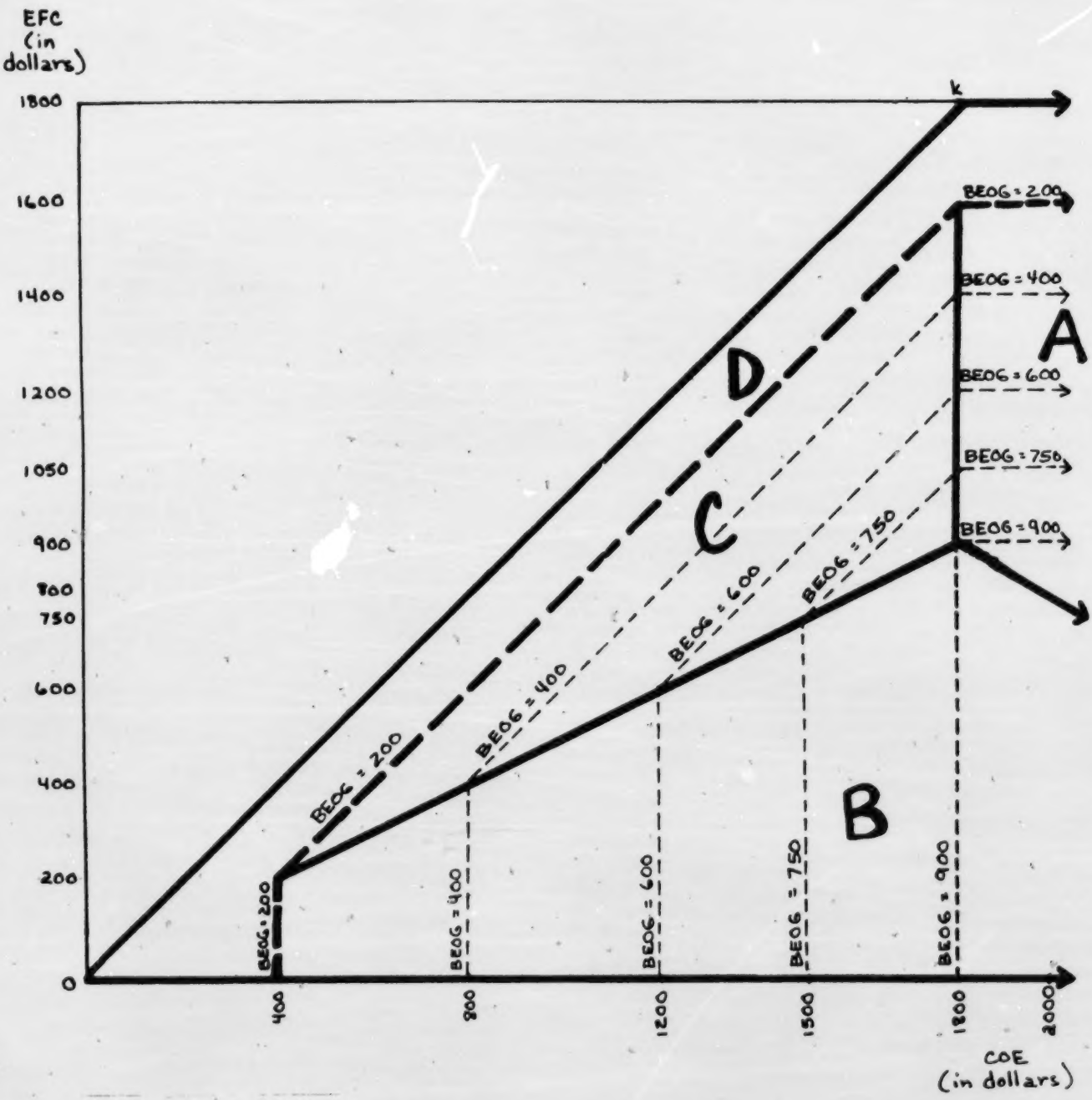
The point to emphasize is that the potential windfall is only part of the story, and before raising charges to capitalize on it, any institution would be well advised to consider the full range of consequences. The ultimate financial outcome will be the net effect of several terms. One, of course, has a positive sign, but others may have negative signs.

APPENDIX

COE is ordinarily regarded as having $1500 as its minimum value although it does take on values below $1500 in a few exceptional circumstances. For completeness it is helpful to have a diagram which takes account of those special cases. Appendix Figure 1 serves that purpose. Its various elements have the same definitions as the comparable elements in Figure 1. Among other things, Appendix Figure 1 shows that $400 is the lowest COE that can generate a BEOG award. While focusing on the lower values of COE, Appendix Figure 1 is incomplete for higher values; the information corresponding to those higher values has already been presented in Figure 1.

Appendix Figure 1

ISO-BEOGs AND THE FOUR REGIONS CORRESPONDING
TO THE FOUR AWARD RULES WITH COE
ASSUMING VALUES BELOW $1500*,**



*Regions, boundaries, and iso-BEOGs are defined the same as in Figure 1. Of the four regions, only region C is fully depicted in this diagram. The portion of each of regions A, B, and D not shown in this diagram is specified in Figure 1.

**The comment made in note 3 regarding region D in Figure 1 is also applicable here.

NOTES

1. This note covers the case of full-funding. It does not deal with the reduction in the size of certain awards made necessary when an annual appropriation is too small to enable all awards to be at their maximum authorized levels.

2. In most instances there will be small differences in the size of awards calculated by a strict application of the procedure just described and the actual size of awards for full-time students published in the Basic Educational Opportunity Grant program's "Payment Schedule 1979-1980." The explanation is that in the payment schedule the relevant variables -- COE and EFC -- are measured in intervals of $50 with each observation on each variable assigned the value at the mid-point of the interval in which it lies. By contrast, this note assumes a more precise measurement of COE and EFC, a measurement to the nearest dollar.

3. D is interpreted as the region in which the award is zero even though COE > EFC, that is, even though there is measured need. There are other points in COE-EFC space for which the award is also zero, but they are all characterized by EFC ≥ COE, that is, by a condition in which there is no measured need.

4. The interested reader may wish to go further and verify that if a particular combination of COE and EFC is on the boundary between A and B, or between B and C, or between A and C, the award will be the same no matter which of the two adjacent regions' constraints is used to compute it. The same feature does not apply for the boundary between C and D or between A and D because of the rule which specifies that the award declines discontinuously from $200 to zero.